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[From the American Journal of Science, Vol. XLVII, May, 1894.]

RESTORATION OF ELOTHERIUM.

WITH PLATE IX.

By O. C. Marsh.

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Art. XLVII.—*Restoration of Elotherium*; by O. C. Marsh. (With Plate IX.)

The genus *Elotherium*, established by Pomel in 1847, represents a family of extinct mammals, all of much interest. They were first found in Europe, but now are known in the Miocene of North America, not only on the Atlantic coast, but especially in the Rocky Mountain region, and still further west. This family includes several genera, or subgenera, and quite a number of species, some of which contain individuals of large size, only surpassed in bulk among their contemporaries by members of the *Rhinoceros* family, and of the huge *Brontotheridæ*.

Remains of this group have thus been known for nearly half a century, yet, until recently, comparatively little had been determined with certainty regarding the skeleton, or of the skull except the dentition, although Aymard, Leidy, Kowalevsky, and others, have made interesting contributions to the subject. In a late paper,* the writer gave figures of a finely preserved skull, and also of a fore and hind foot, of one of the largest species, *Elotherium crassum*, Marsh, and in the present article an attempt is made to restore the entire skeleton of this animal, to serve as a typical example of the group.

The restoration, one-twelfth natural size, given on Plate IX, represents a fully adult individual, which, when alive, was more than seven feet in length and about four feet in height. The basis of this restoration is the type specimen of *Elotherium crassum*, which was found by the writer in 1870, in the Miocene beds of northeastern Colorado, and described in 1873.† A number of other specimens since obtained in the same region, and still others from essentially the same horizon in South Dakota, all evidently pertaining to this species, were likewise used in the restoration.

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* This Journal, vol. xlvi, p. 408, plate viii, November, 1893.

† *Ibid.*, vol. v, p. 487, June, 1873.

The type specimen, although incomplete, includes portions of the skull, with various vertebræ and bones of the limbs and feet, and these were sufficient to determine the general form and proportions of the animal here restored. The additional specimens used are mostly in good preservation, and some of them are almost as perfect as in life. Hence, the skeleton, as represented on Plate IX, is believed to be correct in all its essential features.

Looking at the skeleton, as here shown, it is evident that the most striking features are the large and peculiar skull, and the elongate and slender limbs and feet, characters that do not in themselves suggest the suilline affinities of the animal, which a closer study brings to light. The most notable points in the skull, as here indicated, are the long, pendent process of the malar bone, characteristic of some of the sloths, and the strong projections on the lower jaw. The latter supplement the malar process, but are developed to a greater degree than in any other mammals. Another feature of the skull to which the writer has already called attention is the very small brain-case, which proves that the brain itself was very diminutive. This was also true of the other known species, and was probably the main reason which led to the early extinction of the whole group.

The slender, highly specialized limbs and feet are likewise particularly noticeable in the restoration. They indicate clearly that the animal was capable of considerable speed, and this must have been of great service as a protection from its enemies. It will be seen that in each foot there are only two functional digits, corresponding to the third and fourth in man. The first digit is entirely wanting, and only remnants remain of the second and fifth.

Such reduction was, of course, a gradual process, extending over long geological periods. It indicates clearly a change of environment from the swampy home of the primitive five-toed suilline to the elevated, firm upland of later times, over which the present species and its near allies doubtless roamed. A parallel instance, still more striking, is seen in the gradual change which took place in the equine mammals, as first shown by the writer more than twenty years ago.*

The *Elotheridæ* were evidently true suillines, but formed a collateral branch that became extinct in the Miocene. They doubtless branched off in early Eocene time from the main line, which still survives in the existing swine of the old and new worlds.

Yale University, New Haven, Conn., April 12, 1894.

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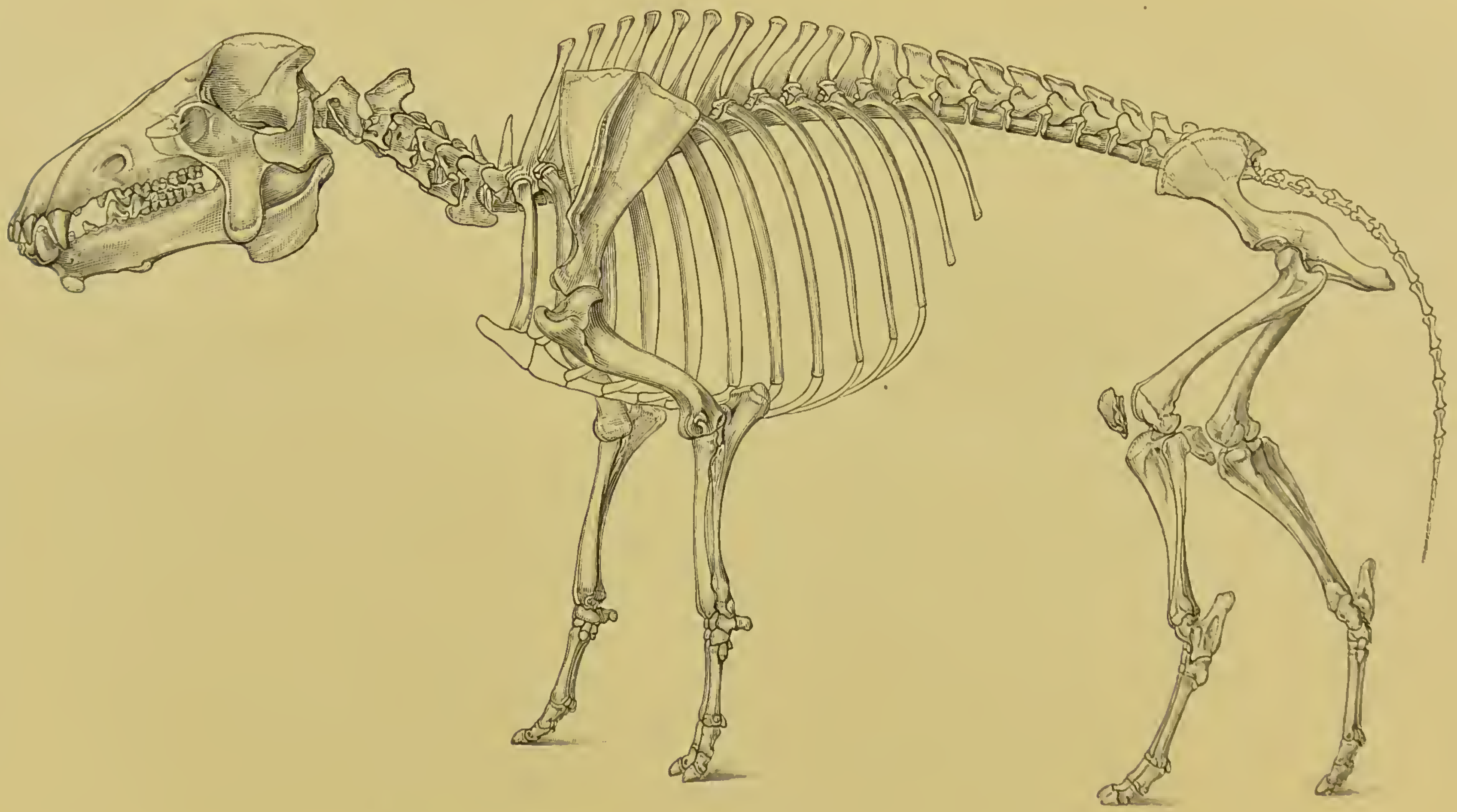
* This Journal, vol. vii, p. 257, March, 1874.



Restoration of ELOTHERIUM CRASSUM, Marsh. One-twelfth natural size.

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